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Dietary supplements to a low protein diet may affect the incidence of hepatic lipidosis in mink

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Hepatic lipidosis, i.e. hepatic lipid infiltration, is multifactorial and it may be caused by a number of factors such as low protein provision, feed deprivation, rapid accretion or mobilisation of body fat, all resulting in metabolic and nutritional imbalances. Our objectives were to investigate if supplementation of a low protein diet with nutrients acting as methyl donors, antioxidants or having insulinogenic properties could lower the incidence of hepatic lipidosis in growing mink from August to November when mortality, caused by hepatic lipid infiltration, often is high.

Seventy-two young mink, 36 females and 36 males, were used in the study. The animals were allocated to six treatment groups each consisting of 6 males and 6 females. The controls were fed a conventional feed (29.6:54.2:16.2% of metabolizable energy (ME) from protein: fat: carbohydrate) whereas the 5 experimental groups were fed a low protein diet (20% of ME from protein, prepared by adding 5.5% corn starch, 3.5 corn oil, 6% potato mash powder, 1% sugar beet pulp and 8% water to the control diet) and supplemented with the crystalline amino acids alanine (0.8% - negative control - group 1), taurine (0.5% - group 2), arginine (0.5% - group 3), and methionine (0.5% - group 4) or dextrose (2.5% of the corn starch was replaced by dextrose - group 5). Feed intake was recorded as an average per group per day. Animals were weighed and blood sampled once every third week. The liver was removed and liver and body weights were recorded of all animals that died during the experiment. All remaining animals were euthanized at the end of the experiment when liver, kidney and body weights were recorded. All livers were frozen for later analysis. Liver weight was significantly affected ($P < 0.001$) by dietary treatment, status (dead or alive) ($P < 0.001$) and interactions between dietary treatment and status ($p < 0.001$). This resulted in significantly heavier livers among animals diagnosed with hepatic lipidosis compared to livers from euthanized animals without hepatic lipidosis. The survival rate was numerically higher for control (100%) and group 4 (methionine - 100%) animals compared to group 1 (alanine - males 84%, females 100%), group 2 (taurine - males 84%, females 100%), group 3 (arginine - males 84%, females 84%) and group 5 (dextrose - males 67%, females 84%).

It can be concluded that our preliminary results indicate that the methionine level in a low protein diet plays an important role for the incidence of hepatic lipidosis.